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REMARKS

By the above amendment, claims 5, 6 and 21-23 which stand withdrawn from consideration as being directed to a non-elected invention have been canceled without prejudice to the right to file a divisional application directed thereto. Additionally, independent claims 1 and 9 and the dependent claims thereof have been amended to clarify the feature of the present invention of utilization of interference lights of different wavelengths. Applicants submit that claims 1 and 9, as amended, and the dependent claims patentably distinguish over the cited art as will become clear from the following discussion.

As pointed out in the previous Amendment of May 15, 2003, the present invention utilizes interference lights P_1 and P_2 of different wavelengths in order to detect the end point of polishing processing as illustrated in Fig. 1, for example. That is, as described, lights L_1 and L_2 of different wavelength are simultaneously irradiated onto an optically transparent thin film 18 formed on a surface of the wafer 3 undergoing polishing processing and interference lights P_1 and P_2 are separately detected, as shown in Fig. 1, for example, which interference lights is generated by interference between the lights reflected from a surface of the thin film and surfaces of the patterns formed on the wafer with the lights of the different wavelengths which are irradiated. According to the present invention, the end point of polishing processing is detected on the basis of a relationship between intensities of the separately detected interference lights of the different wavelengths. That is, as described at page 18, lines 18-24 of the specification, the intensity ratio P_1/P_2 is determined and an end point T of the polishing processing is determined when the intensity ratio P_1/P_2 is equal to a value X_1 of a film thickness obtained by a calculation of an experiment. As is apparent, P_1 represents a detected interference light of one wavelength and P_2 represents a detected interference light of a different wavelength. By the present amendment, independent claims 1 and 9 have been amended to clarify such features, and applicants submit that the recited features of

independent claims 1 and 9 and the dependent claims are not disclosed or taught in the cited art.

The rejection of claims 1, 2, 18 and 19 under 35 U.S.C. 103(a) as being unpatentable over Sandhu (US 5,910,846) in view of Aiyer et al (US 5,838,448); the rejection of claim 20 under 35 U.S.C. 103(a) as being unpatentable over Sandhu (US '846) in view of Aiyer (US '448) and further in view of Birang (US 5,964,643); the rejection of claims 9, 24, 26 and 27 under 35 U.S.C. 103(a) as being unpatentable over Sandhu (US '846) in view of Aiyer et al (US '388) and further in view of Woo (WO 99/30109), Pollock (US 5,770,521) and Cadien et al (US 5,954,975); and the rejection of claims 10 and 11 under 35 U.S.C. 103(a) as being unpatentable over Sandhu (US '846) in view of Aiyer et al (US '388), Woo (WO 99/30109), Pollock (US '421), and Cadien (US '975) and further in view of Hiyma et al (US 5,838,447); such rejections are traversed insofar as they are applicable to the present claims, and reconsideration and withdrawal of the rejections are respectfully requested.

As to the requirements to support a rejection under 35 U.S.C. 103, reference is made to the decision of In re Fine, 5 USPQ 2d 1596 (Fed. Cir. 1988), wherein the court pointed out that the PTO has the burden under §103 to establish a prima facie case of obviousness and can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. As noted by the court, whether a particular combination might be "obvious to try" is not a legitimate test of patentability and obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. As further noted by the court, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.

Furthermore, such requirements have been clarified in the recent decision of In re Lee, 61 USPQ 2d 1430 (Fed. Cir. 2002) wherein the court in reversing an

obviousness rejection indicated that deficiencies of the cited references cannot be remedied with conclusions about what is "basic knowledge" or "common knowledge".

The court pointed out:

The Examiner's conclusory statements that "the demonstration mode is just a programmable feature which can be used in many different device[s] for providing automatic introduction by adding the proper programming software" and that "another motivation would be that the automatic demonstration mode is user friendly and it functions as a tutorial" do not adequately address the issue of motivation to combine. This factual question of motivation is immaterial to patentability, and could not be resolved on subjected belief and unknown authority. It is improper, in determining whether a person of ordinary skill would have been led to this combination of references, simply to "[use] that which the inventor taught against its teacher."... Thus, the Board must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the agency's conclusion. (emphasis added)

In setting forth the rejection of the claims based upon the combination of Sandhu and Aiyer et al, applicants submit that the Examiner mischaracterizes the individual references in relation to the claimed invention, and applicants submit that the combination fails to provide the claimed features as now recited in independent claims 1 and 9. Turning first to Sandhu, applicants submit that this patent discloses as illustrated in Figs. 2 and 3, for example, utilizing a laser 80 with an emitter 82 for directing a laser beam 84 to impinge the surface of the wafer 12, and a reflected beam 86 reflects from the surface of the wafer 12 to a photosensor 88. The photosensor 88 senses the intensity of the reflected beam 86, which depends upon whether the laser beam 84 impinges the upper layer 70 or the lower layer 60, as described at col. 5, lines 21-30 of Sandhu. While col. 6, lines 8-12 of Sandhu provides that different wavelengths of light may be used such that the intensity of the reflected light may be measured at different wavelengths to get a more reliable signature of the material, there is no disclosure or teaching in Sandhu of

simultaneously irradiating lights having different wavelengths from one another in the manner defined. Moreover, applicants note that as described in col. 6, lines 43-58 of Sandhu, the final step 150 of the method is to compare the actual intensity of the reflected light beam 86 with an expected intensity at the end point of the CMP process. Irrespective of the position set forth by the Examiner, applicants submit that Sandhu does not disclose or teach, in addition to the simultaneous irradiation of lights having different wavelengths from one another, the separate detection of interference lights of said respective lights having the different wavelengths caused by interference between lights reflected from a surface of said thin film and surfaces of said patterns formed on said wafer with the lights of the different wavelengths which are irradiated, as essentially recited in both independent claims 1 and 9. Furthermore, applicants submit that Sandhu also fails to detect the end point of polishing processing of the film on the basis of a relationship between intensities of the separately detected interference lights of the different wavelengths, as recited in independent claim 1, or by comparing at least an intensity of the separately detected interference lights of the different wavelengths, as recited in independent claim 9. As such, applicants submit that Sandhu fails to disclose or teach the recited features in the sense of 35 U.S.C. 103 and independent claims 1 and 9 and the dependent claims patentably distinguish thereover.

With respect to Aiyer et al, the Examiner contends that this patent teaches detection under polishing processing and that a different wavelength may be used. Irrespective of this position set forth by the Examiner, applicants submit that Aiyer et al fails to disclose or teach the simultaneous irradiation with different wavelengths, irrespective of the disclosure in Aiyer et al of illuminating the back side of the surface of the wafer with one wavelength and alternatively illuminating a front side of the wafer with a different wavelength. In any event, Aiyer et al discloses that as the incident angle of the incident light on the wafer being polished is changed, the reflected intensity of the light from the thin film on the wafer undergoes a variation in

local maxima and minima and the angle at which the light intensity is a maximum or minimum determined by the thin film interference equation provides a measurement of the thin film thickness and/or the change in the thin film thickness. However, Aiyer et al, like Sandhu, fails to disclose or teach separate detection of interference lights of respective lights having different wavelengths caused by interference between lights reflected from the surface of the thin film and surfaces of the patterns formed on the wafer with the lights of the different wavelengths which are irradiated, and detecting the end point of polishing processing of the thin on the basis of the relationship between intensities of the separately detected interference lights of the different wavelengths, as recited in claim 1 and the similar recitation in claim 9. Thus, applicants submit that Aiyer et al fails to overcome the deficiencies of Sandhu, and irrespective of the position set forth by the Examiner cannot be combined with Sandhu to provide the claimed features as recited in independent claims 1 and 9 and the dependent claims of this application. Accordingly, applicants submit that all claims present in this application patentably distinguish over Sandhu and Aiyer et al, taken alone or in any combination thereof, in the sense of 35 U.S.C. 103 and should be considered allowable thereover.

Applicants note that the Examiner has utilized the art of Woo, Pollock and Cadien et al in combination with Sandhu and Aiyer et al in relation to independent claim 9 and the dependent claims. However, applicants submit that Woo, Pollock and Cadien et al, irrespective of the position set forth by the Examiner, fail to disclose or teach the recited features as pointed out above which are not disclosed or taught by Sandhu and Aiyer et al taken alone or in combination, such that this proposed combination of references also fails to disclose or teach the recited features of the independent claims 1 and 9 and the dependent claims thereof, and all claims patentably distinguish over this cited art.

Likewise, with respect to the other cited art utilized in connection with Sandhu and Aiyer et al, such as Birang and Hiyama et al, such references also fail to

overcome the above noted deficiencies of Sandhu and Aiyer et al and the proposed combination fails to provide the claimed features as recited in independent claim 1 and the dependent claims thereof, such that all claims should be considered allowable over any proposed combination of references as set forth in the Office Action.

Applicants note that the dependent claims recite further features of the present invention and irrespective of whether or not an individual reference may disclose a single claimed feature, the combination of references as proposed by the Examiner fail to provide the claimed features as set forth in independent claims 1 and 9 and the dependent claims of this application, such that all claims present in this application should now be in condition for allowance.

In view of the above amendments and remarks, applicants submit that all claims present in this application should now be in condition for allowance, and issuance of an action of a favorable nature is courteously solicited.

To the extent necessary, applicant's petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 01-2135 (500.39825X00) and please credit any excess fees to such deposit account.

Respectfully submitted,



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